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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,713	09/30/2004	Louis C. Hsu	FIS920040082US1	5712
32074 7590 12/11/2007 INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			EXAMINER TORRES, JUAN A	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 12/11/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/711,713

Applicant(s)

HSU ET AL.

Examiner

Juan A. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-13 is/are allowed.
- 6) ☒ Claim(s) 1-7 and 14-19 is/are rejected.
- 7) ☒ Claim(s) 8-10, 20 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/18/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 10/18/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Drawings***

The drawings are objected to because:

a) In figure 1 it seems that the two capacitors between the lines and the receiver are improper, because in a DC coupling the capacitor will not allow the DC conductive connection; it is suggested to review figure 1 and to delete the capacitors.

b) It is also suggested to review the resistors between  $V_{tr}=V_{tt}$  and the lines in figure 1, that it seems that should be there (see paragraph [Para 5] in page 3 of 40).

c) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "15" (see figure 3); "N80", "P80", "INV4", "INV5", "INV6", "INV7" (see figure 7); and "121", "122", "123", "125", "126" (see figure 8).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Laamanen (US 20030035495 A1).

Regarding claim 1, Laamanen discloses a data receiver operable to receive a signal controllably pre-distorted and transmitted by a transmitter, to generate information for adjusting the pre-distortion applied to the signal transmitted by the transmitter, and to transmit the information to the transmitter, the data receiver further being operable to perform adaptive equalization to receive the signal transmitted by the transmitter (abstract, figure 9, paragraphs [0073]-[0076], figures 10 and 11 paragraphs [0077]-[0079] also present a variation of the same system).

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Regarding claim 2, Laamanen discloses claim 1, Laamanen also discloses a decision feedback equalizer operable to perform the adaptive equalization of the signal received from the transmitter (abstract, figure 9 DFE, paragraphs [0073]-[0076], figures 10 and 11 paragraphs [0077]-[0079] also present a variation of the same system).

Regarding claim 14, Laamanen discloses receiving values of data bits from the data-carrying signal with equalization at the receiver (abstract, figure 9, paragraphs [0073]-[0076]); generating first information for adjusting an amount of the equalization performed at the receiver (abstract, figure 9, paragraphs [0073]-[0076]); generating second information for adjusting an amount of pre-distortion applied to the data-carrying signal by the transmitter (abstract, figure 9, paragraphs [0073]-[0076]); and transmitting the second information to the transmitter (abstract, figure 9, paragraphs [0014], [0063] and [0066])

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laamanen as applied to claim 2 above, and further in view of Lapointe (US 20070147559 A1).

Regarding claim 3, Laamanen discloses claim 2, Laamanen doesn't specifically disclose that the transmitter equalizer is a feed forward equalizer, Lapointe discloses a

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transmitter equalizer that is a feed forward equalizer (figure 1 block 118 paragraph [0005]). Laamanen and Lapointe teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use a feed forward equalizer as disclosed by Lapointe in the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to reduce the complexity of the system (Lapointe paragraph [0030]).

Regarding claim 4, Laamanen and Lapointe disclose claim 3, Laamanen also discloses that the information for adjusting a characteristic of the transmitter equalizer includes information for adjusting tap coefficients of the transmitter equalizer (abstract, figure 9, paragraph [0073]).

Regarding claim 15, Laamanen discloses claim 14, Laamanen doesn't disclose that the transmitter equalizer is a feed forward equalizer, Lapointe discloses a transmitter equalizer is a feed forward equalizer (figure 1 block 118 paragraph [0005]). Laamanen and Lapointe teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use a feed forward equalizer as disclosed by Lapointe in the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to reduce the complexity of the system (Lapointe paragraph [0030]).

Regarding claim 16, Laamanen and Lapointe disclose claim 16, Laamanen also discloses that the information for adjusting a characteristic of the transmitter equalizer

includes information for adjusting tap coefficients of the transmitter equalizer (abstract, figure 9, paragraph [0073]).

Claims 5-6 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laamanen as applied to claim 2 above, and further in view of Phanse (US 6798828 B1).

Regarding claim 5, Laamanen discloses claim 1, Laamanen doesn't disclose to compensate a direct current (DC) voltage offset of the signal, Phanse discloses to compensate a direct current (DC) voltage offset of the signal (figure 1 block 125 column 6 lines 17-29). Laamanen and Phanse teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the DC offset correction disclosed by Phanse in the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to improve the performance of the system (Phanse column 3 lines 27-42).

Regarding claim 6, Laamanen and Phanse disclose claim 5, Phanse also discloses digitally controlled reference current generator operable to compensate the DC voltage offset, the reference current generator controlled as a result of the adaptive equalization (figure 2A block 125 column 7 lines 10-43). Laamanen and Phanse teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the DC offset correction disclosed by Phanse in

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the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to improve the performance of the system (Phanse column 3 lines 27-42).

Regarding claim 17, Laamanen discloses claim 14, Laamanen doesn't disclose compensating a direct current (DC) voltage offset of the data-carrying signal at the data receiver, Phanse discloses compensating a direct current (DC) voltage offset of the data-carrying signal at the data receiver (figure 1 block 125 column 6 lines 17-29).

Laamanen and Phanse teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the DC offset correction disclosed by Phanse in the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to improve the performance of the system (Phanse column 3 lines 27-42).

Regarding claim 18, Laamanen and Phanse disclose claim 17, Phanse also discloses controlling an amount of the DC voltage offset compensation as a result of the equalization performed at the receiver (figure 2A block 125 column 7 lines 10-43).

Laamanen and Phanse teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the DC offset correction disclosed by Phanse in the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to improve the performance of the system (Phanse column 3 lines 27-42).



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Regarding claim 19, Laamanen discloses claim 14, Laamanen doesn't disclose using an automatic gain controlled amplifier at the receiver to amplify the data-carrying signal to a predetermined level, Phanse discloses using an automatic gain controlled amplifier at the receiver to amplify the data-carrying signal to a predetermined level (figure 1 block 125 column 6 lines 17-29). Laamanen and Phanse teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the AGC disclosed by Phanse in the equalization disclosed by Laamanen. The suggestion/motivation for doing so would have been to amplify the incoming signal to an appropriate level (Phanse column 6 lines 61-65).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laamanen and Lapointe as applied to claim 4 above, and further in view of Phanse (US 6798828 B1).

Regarding claim 7, Laamanen and Lapointe disclose claim 4, Laamanen and Lapointe don't disclose an automatic gain control unit operable to amplify the received signal to a predetermined level, Phanse discloses an automatic gain control unit operable to amplify the received signal to a predetermined level (figure 1 block 135 column 6 lines 61-65). Laamanen, Lapointe and Phanse teachings are analogous art because they are from the same field of endeavor of equalization system. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the AGC disclosed by Phanse in the equalization disclosed by Laamanen

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and Lapointe. The suggestion/motivation for doing so would have been to amplify the incoming signal to an appropriate level (Phanse column 6 lines 61-65).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a) Herzberg (US 5881108 A) discloses a pre-equalizer that adapts to changes in the communications channel by processing an error signal that is communicated over a reverse channel by a corresponding receiver.

b) Langberg (US 6243425 B1) discloses an adaptive preceding system implemented within a data communications system in order to precode data to track changes in a communications channel.

c) Frenkel (US 20020044598 A1) discloses a data communication system with adaptive precoding.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres  
09-08-2007

